7 Editing and Saving Voices

In addition to the versatile Flute Voices section, the EL-90/70 Electones have a Voice Edit feature that allows you to create your own voices. Voice Edit uses sophisticated sound shaping tools that make it possible to craft just about any kind of sound—from authentic recreations of acoustic instruments to wild electronic voices and special effects.

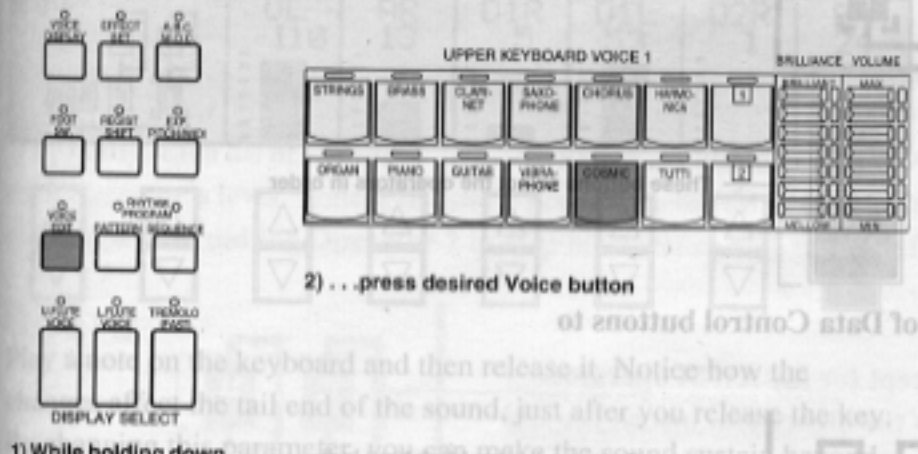
Selecting a Voice and Editing Some of its Parameters

This short section will introduce you to the basics of voice editing by taking you step by step through a specific editing example. There is no set order you necessarily have to follow when editing voices. However, working through the steps in the order given below will greatly help you in understanding how to create a wide variety of voices on your own.

As you follow the steps in this section, you may find many of the terms and parameter names to be unfamiliar. You can largely ignore those terms since they are explained more fully in the Voice Editing Basics section. For the moment, simply follow the instructions and listen to the voice as you're changing it — you'll undoubtedly learn more about the various editing components by hearing what they do, rather than by reading about them. Once you go through these editing steps, however, we suggest that you read through the Voice Editing Basics section to get a firmer understanding of the principles behind voice editing.

1. While holding down the VOICE EDIT button in the DISPLAY SELECT section, press the Voice button corresponding to the voice you wish to edit. For this example, select COSMIC from the UPPER VOICES 1 section.

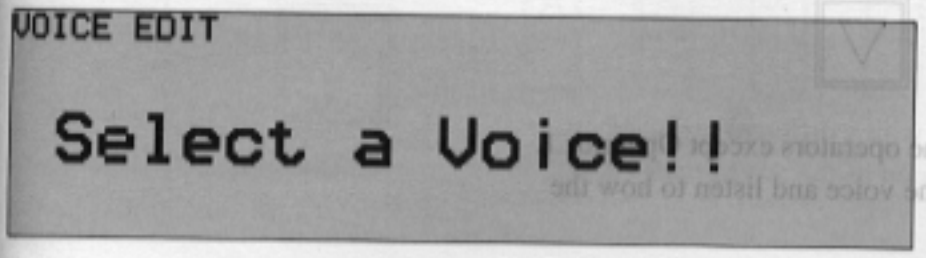
> **Note:** Only panel voices and Voice Menu voices can be edited with the Voice Edit controls. Flute Voices have their own editing controls and cannot be edited here.



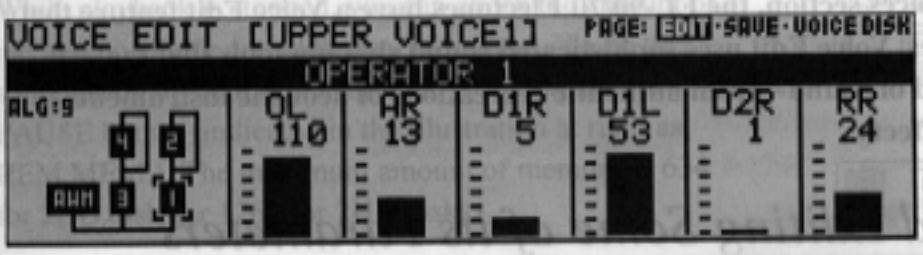
1) While holding down VOICE EDIT button...

2) . . .press desired Voice button

If you press VOICE EDIT without selecting a voice, the following display will prompt you to complete the step:



After you have selected a voice –COSMIC 1, in this example–the following LCD will appear:



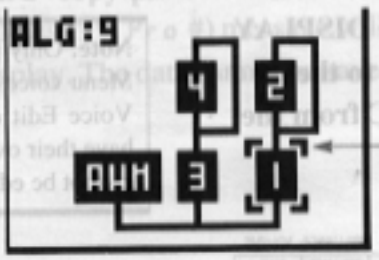
Algorithm and Operators

At the left side of the display is the algorithm used for this voice. An algorithm is a kind of "map" that shows how the sound components of the voice are related to each other. Each voice has five separate sound components and they are called "operators."

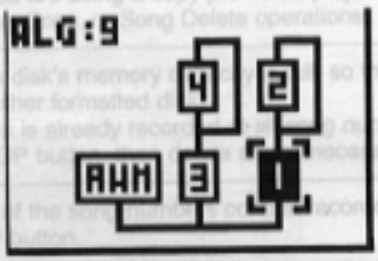
2. Begin changing the sound by turning off all operators, except Operator 1.

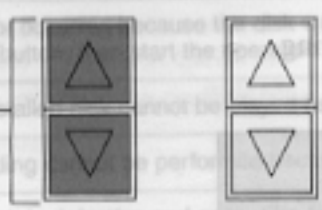
To turn off each operator:

First, use the pair of Data Control buttons just below the algorithm display (under box 1) to select an operator...



...then press one of the far left pair of Data Control buttons to turn the selected operator off.



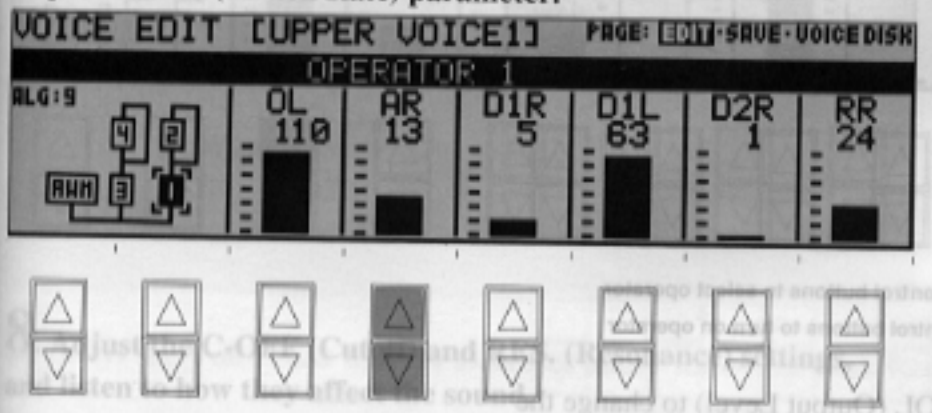


Repeat the above process for all of the operators except Operator 1. As you turn off each operator, play the voice and listen to how the sound changes.

3. Adjust the envelope parameters of Operator 1.

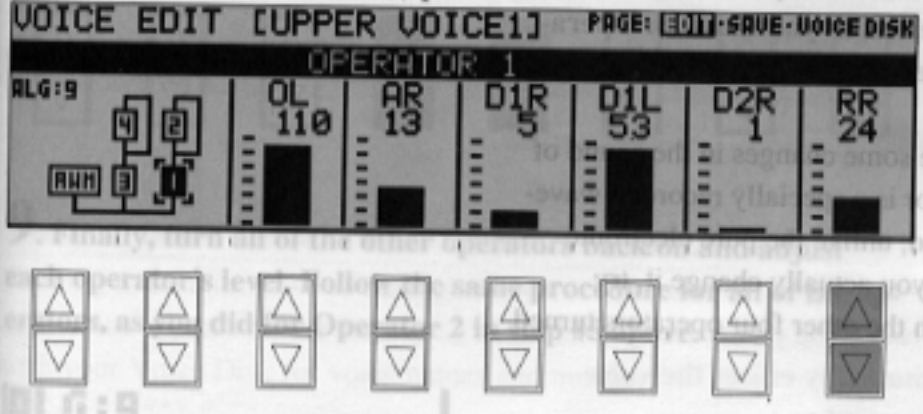
The envelope parameters control the level of the sound and how that level changes over time. For now, try making some of these changes in the envelope:

Adjust the AR (Attack Rate) parameter.



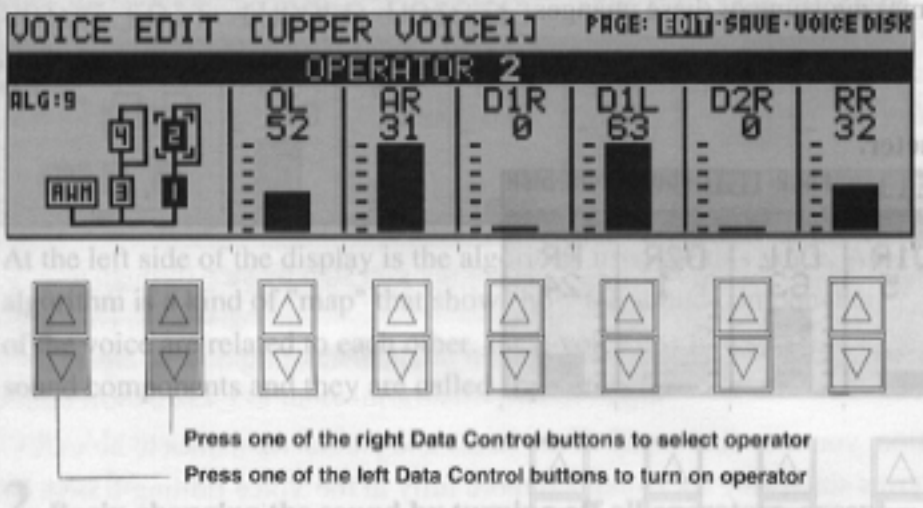
Play the voice and notice how the changes you make affect the initial volume of the voice. By changing this parameter you can make the sound gradually get louder or have it reach its full volume all at once.

Adjust the RR (Release Rate) parameter.



Play a note on the keyboard and then release it. Notice how the changes affect the tail end of the sound, just after you release the key. By changing this parameter, you can make the sound sustain beyond the release point.

4. Keeping Operator 1 on, select and turn on Operator 2, then adjust the operator level.

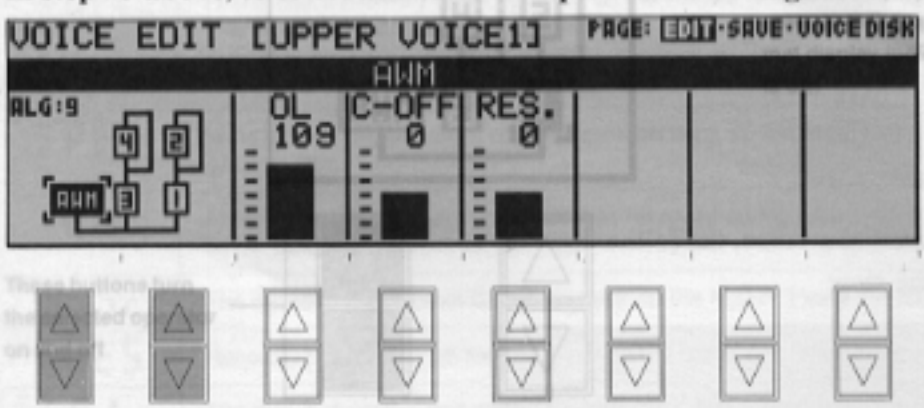


Use the Data Control buttons below OL (Output Level) to change the level of Operator 2. Notice that the volume of the sound doesn't change, but the tone does. Increasing the level of one of the top row operators generally makes the tone of the operator below it brighter or more metallic. Decreasing the level has the opposite effect.

5. Turn off Operators 1 and 2, and turn on Operators 3 and 4. Make some changes to their parameters, as you did with Operators 1 and 2 in steps #3 and #4 above.

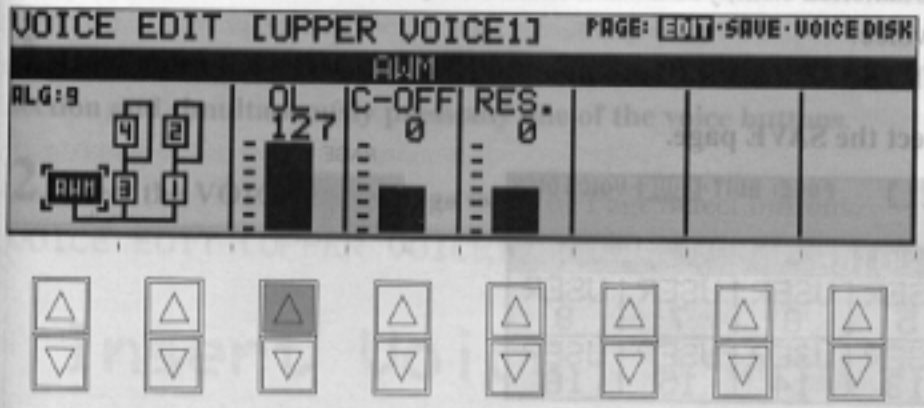
Next, starting with step #6, we'll make some changes in the sound of the AWM operator. The AWM operator is a specially recorded waveform with an actual instrumental sound, unlike the pure electronic sounds of the other operators. Before you actually change it, try listening to this sound on its own, with the other four operators turned off. To do this:

6. Turn off all of the operators, except for the AWM operator. Use the Data Control buttons below the algorithm, just as you did in step #3 above, to select and turn off Operators 1 through 4.

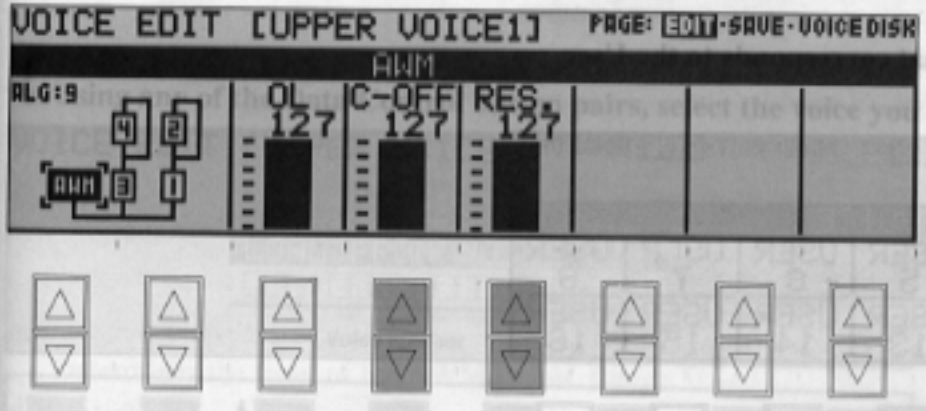


The AWM operator has its own page with a different group of settings. The display above appears as soon as the AWM operator has been selected.

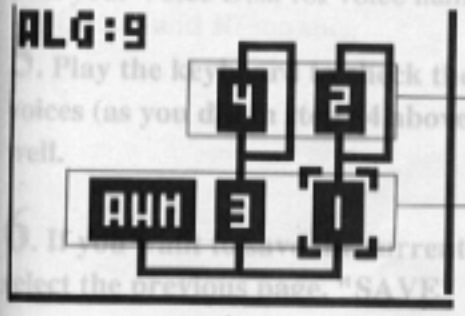
7. Set the AWM output level to its maximum value, and play the voice.



8. Adjust the C-OFF (Cutoff) and RES. (Resonance) settings, and listen to how they affect the sound.



9. Finally, turn all of the other operators back on and adjust each operator's level. Follow the same procedure for all of the operators, as you did for Operator 2 in step #5 above.



These top row operators change the tone of the operators below.

These bottom row operators generate the various the sounds of the voice.

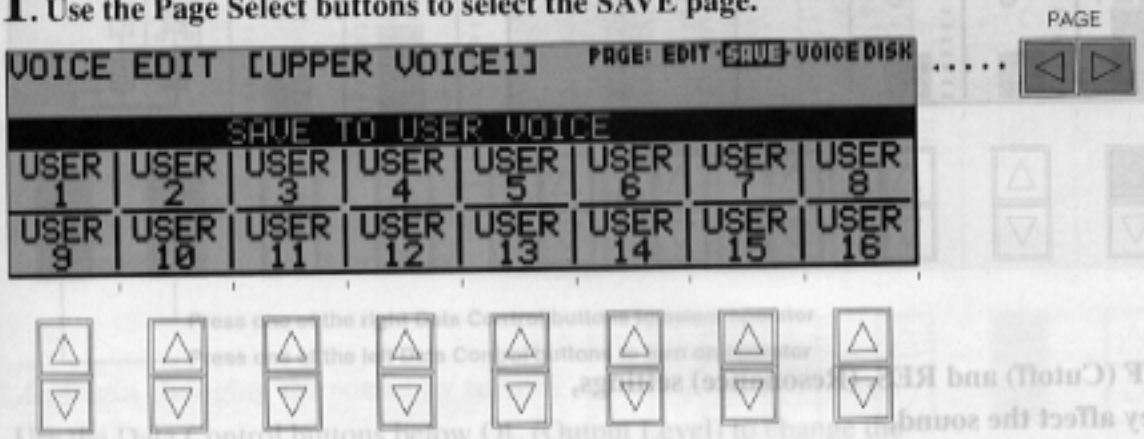
Note: No sound will be produced nor will adjusting the top row operators have any effect if all of the bottom row operators have been turned off or set to their minimum level. Be sure to turn on the bottom row of operators and set them to a suitable level before changing the parameters of the top row operators.

Note: After making changes in the voice, you can restore the original voice by switching to another function. If, however, you wish to keep the newly created voice for future use, you should save it. (See following section.)

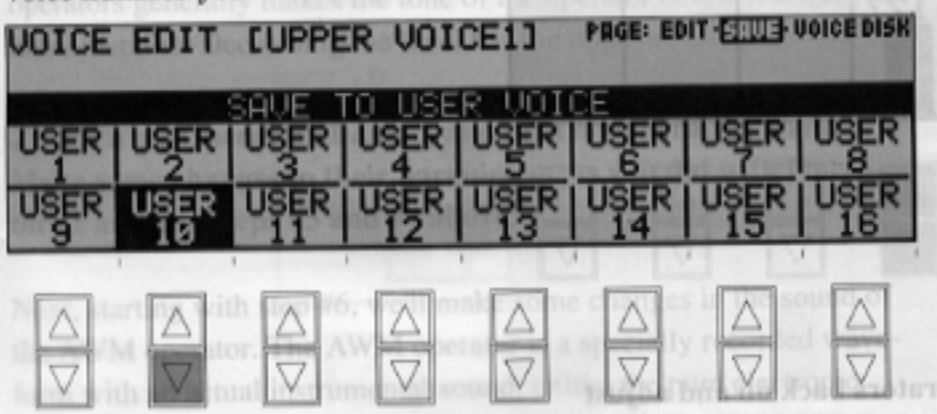
Saving Your New Voice

Once you have created a sound you are satisfied with, you'll want to save that sound for future use. Here's how you can save your newly created voice:

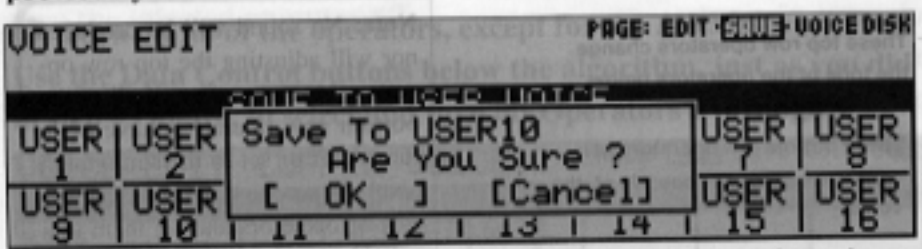
1. Use the Page Select buttons to select the SAVE page.



2. Press the Data Control button that corresponds to the User voice number you wish to save to.

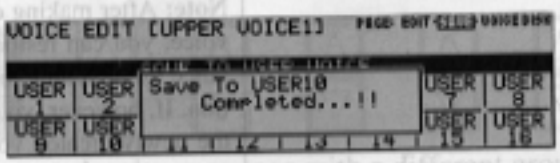


3. The following display appears, prompting confirmation of the operation. (Saving a new voice automatically erases the voice previously stored to the selected User number.)



Press any of the Data Control buttons below "OK" to save the voice, or press any of the buttons below "Cancel" to abort the operation.

When the voice has been saved, the following display appears:



This Save page shows the same voices as the last page (USER) of the dotted buttons' Voice Menu. Once the voice has been saved, it can be selected from any dotted button's Voice Menu.

Note: This operation automatically erases any voice that had been previously saved to the selected User voice number. You should check the User voices (see Selecting User Voices, p.19.) before loading a voice to make sure that you will not be erasing any important voices.

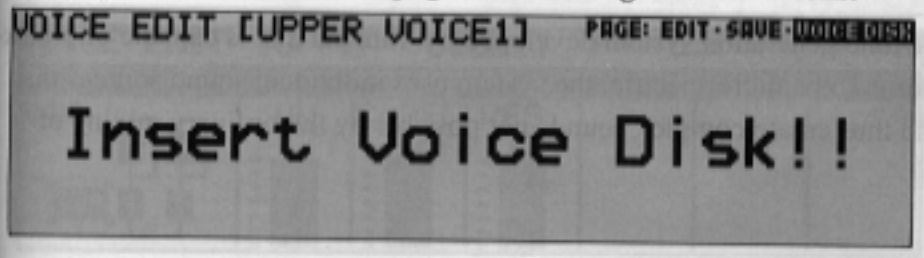
Selecting Voices From a Voice Disk (Optional)

You can also load voices from optional Voice Disks to the 16 User voices in the Voice Menu. To do this:

1. Hold down the VOICE EDIT button in the DISPLAY SELECT section and simultaneously press any one of the voice buttons.

Note: Make sure that the volumes of all other voices are set to off (the minimum value).

2. Select the VOICE DISK page with the Page Select buttons.



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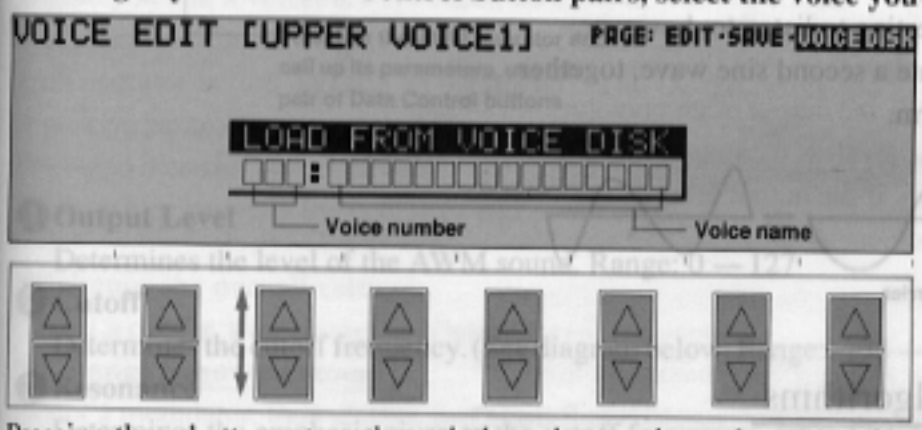
3. Insert the Voice Disk into the Disk slot under the Music Disk Recorder.

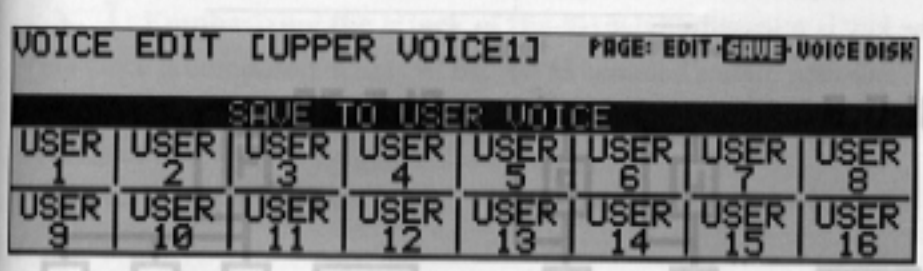
4. Using any of the Data Control button pairs, select the voice you wish to load.



Pressing these buttons steps through the voice numbers; the name of each voice appears on the display as well. Refer to the list included with your Voice Disk for voice names and numbers.

5. Play the keyboard to check the sound of the voice. Select other voices (as you did in step #4 above) and check those sounds as well.

6. If you want to save the current voice to a User Voice space, select the previous page, "SAVE" with the Page Select buttons.



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7. Press the Data Control button that corresponds to the User Voice number you wish to save to.

8. Press one of the four Data Control buttons below "OK" in the display to save the voice, or one of the four buttons below "Cancel" to abort the operation and return to the previous display.

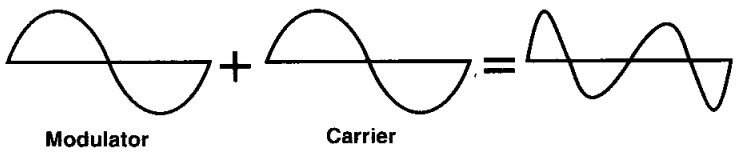
When the voice has been saved, a "completed" message appears.

Voice Editing Basics

The EL-90/70 Electones use a versatile tone generation system developed by Yamaha that is capable of producing an exceptionally wide range of voices. To be more specific, the system uses individual sound sources that "modulate" each other's frequencies and thus create complex sounds not possible by the ordinary mixing of those sound sources.

Operators

Along with the sophisticated AWM sound sources that are the backbone of the Electone's authentic voices, the tone generation system features other sound sources called "operators." An operator is a sound generator that produces one very simple type of sound: a pure sine wave. A sine wave by itself is not very interesting to listen to; however, when one sine wave is used to modulate a second sine wave, together they result in a new, complex waveform.

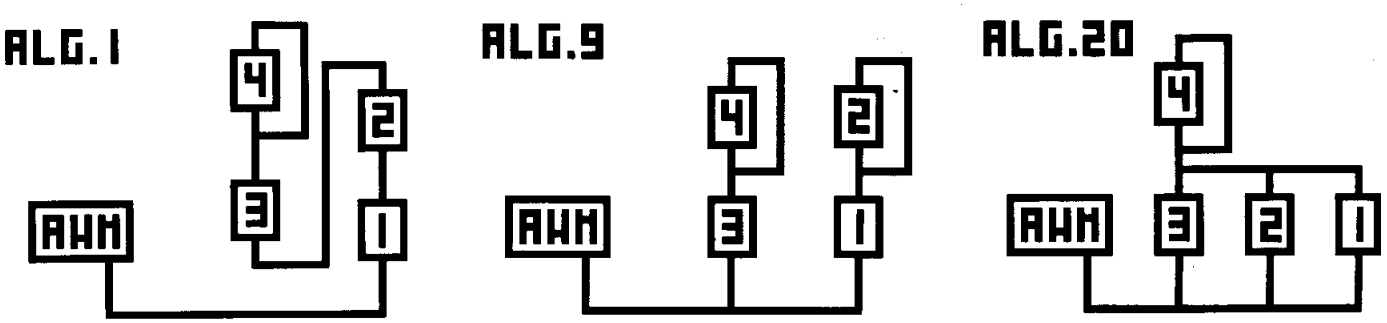


Modulators, Carriers and Algorithms

The top operator, which sends the modulation signal is, not surprisingly, called the modulator. The bottom operator, which receives or "carries" the modulated sine wave and outputs the resulting sound, is called the carrier. The complexity or brightness of the sound depends on the output level of the modulator.

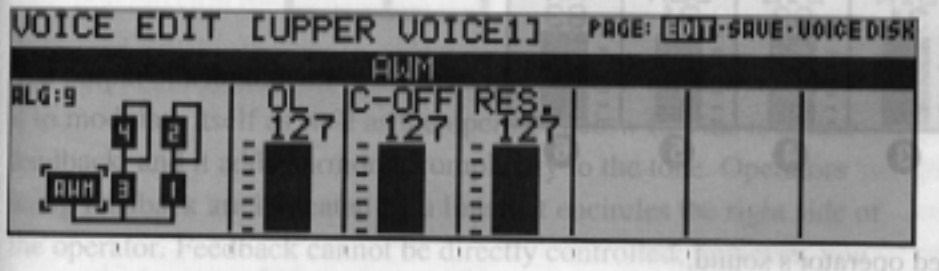
This kind of arrangement in which operators are "stacked" together is called an algorithm. With four sine wave operators available for stacking, the various algorithms can produce a wide variety of sounds.

Example Voice Algorithms



AWM Operators

Each algorithm also has a special AWM (Advanced Wave Memory) operator. AWM operators are not sine waves like the other operators, but are digital recordings of actual instrument sounds, such as piano, violin, guitar, and so on. The AWM operator's sound is mixed with the sounds of the other operators in the algorithm to create realistic voices.



To select the AWM operator and call up its parameters, use this pair of Data Control buttons under the algorithm.

❶ Output Level

Determines the level of the AWM sound. Range: 0 — 127

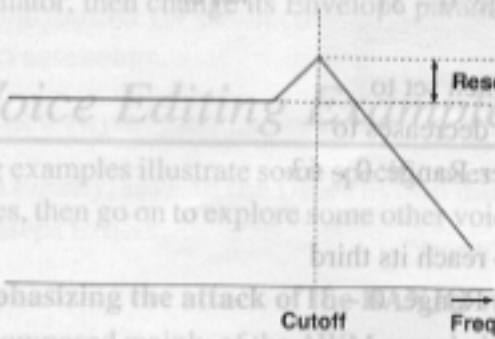
❷ Cutoff

Determines the cutoff frequency. (See diagram below. Range: -128 — +127

❸ Resonance

Determines the emphasis given to the cutoff frequency, set in Cutoff above. (See diagram below.) Range: -128 — +127

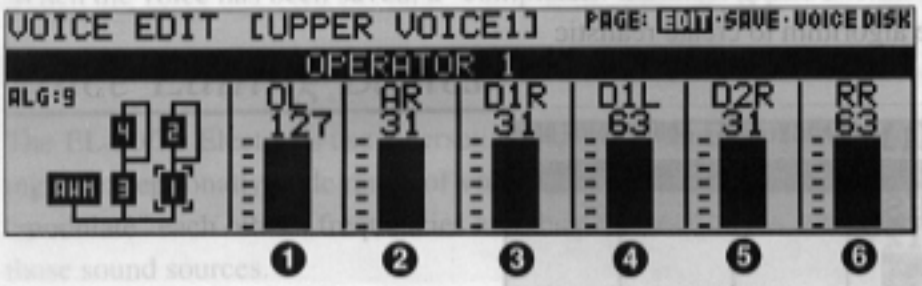
Cutoff and Resonance



Example of low pass filter operation, with a positive Resonance setting.

Operators 1 — 4

Operators 1 through 4 are the sine wave operators of the algorithm. When one of these operators has been selected, the following parameters are displayed:

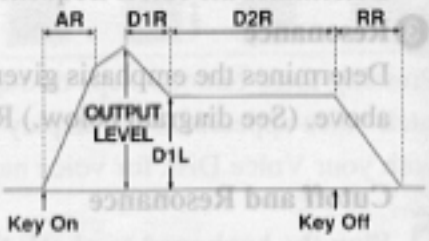


❶ Output Level

Determines the level of the selected operator's sound.
Range: 0 — 127

Envelope Parameters

By using the modulators and setting them to various output levels, you can create all kinds of sounds. These sounds will be static, however, unless you have the output levels change in time. That is precisely what an envelope does. It varies the output of an operator in time so that you can vary the tone or the level. If the output of the modulator changes, the tone will change. If the output level of the carrier changes, the volume will change.



❷ Attack Rate (AR)

Determines how quickly the operator will reach its maximum level after the key is played. Lower values produce a slower attack. Range: 0 – 31

❸ Decay 1 Rate (D1R)

Determines how much time it takes for the operator to reach its second level, set in the Decay 1 Level parameter. Range: 0 – 31

❹ Decay 1 Level (D1L)

Determines the second level setting of the operator. When set to values of less than 63, the maximum level "decays" or decreases to this point, according to the rate set in the D1R parameter. Range: 0 – 63

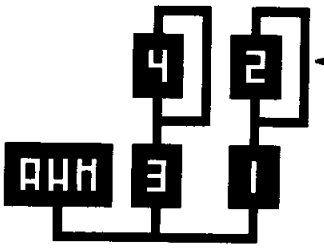
❺ Decay 2 Rate (D2R)

Determines how much time it takes for the operator to reach its third level, or the minimum level before the key is released. Range: 0 – 31

❻ Release Rate (RR)

Determines how much time it takes for the level to reach 0 after the key is released. Range: 0 – 63

Feedback



Feedback loop — operator output is sent back to input.

The output of a modulator can also be circled back to its input, allowing it to modulate itself as well as the operator below it. This is called feedback, and it adds harmonic complexity to the tone. Operators using feedback are indicated by a line that encircles the right side of the operator. Feedback cannot be directly controlled; however, you can adjust the parameters of operators that have feedback to change the characteristics of the feedback sound.

General Guidelines for Editing Operators

Before you edit a voice, always check its algorithm to see which operators function as carriers and which as modulators. Then select each operator in turn and edit its parameters. The Output Level and Envelope parameters function differently depending on whether they belong to a carrier or a modulator. The following list illustrates the relationships between the operators and parameters:

To change the overall volume:
Select a carrier, then change its Output Level parameters.
To change the overall tone:
Select a modulator, then change its Output Level parameters.
To change how the volume varies over time:
Select a carrier, then change its Envelope parameters.
To change how the tone varies over time:
Select a modulator, then change its Envelope parameters.

Some Voice Editing Examples

The following examples illustrate some specific uses of the Voice Edit controls. Make the changes as described in the examples, then go on to explore some other voices on your own, making changes as you like.

Ex. 1: Emphasizing the attack of the BANJO voice

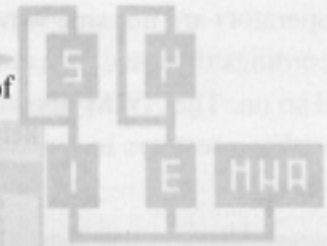
This voice is composed mainly of the AWM sampled sound, with the other operators providing the noise attack sound, simulating the picking of the string.

Try changing the sound of the attack by increasing the Output Level (OL) of Operator 1.

Ex. 2: Adding "bite" to the JAZZ ORGAN 1 voice (ORGAN Voice Menu)

Operator 1 provides the 8' footage sound, Operator 2 the 4', and Operator 3 the 2-2/3'.

You can make the sound warmer by decreasing the Output Level of Operator 2. Increasing the Output Level of Operator 3 makes for a rougher edge or more "bite" in the organ sound.



Ex. 3: Adding a PICCOLO sound to the GLOCKEN. voice

This example shows how the AWM Operator can be used to add another instrument sound to an existing voice. The glockenspiel sound is provided by the FM Operators.

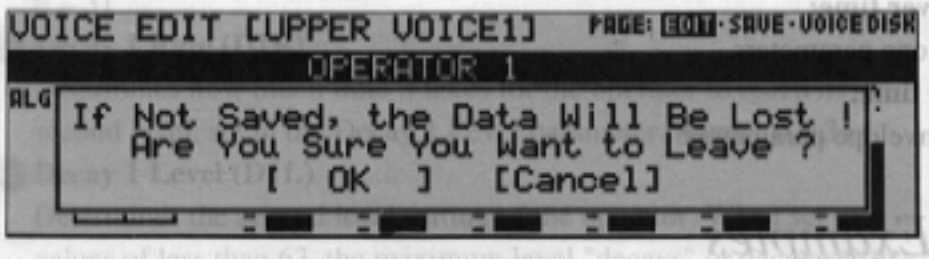
In this case, a piccolo sound has been specially programmed with the AWM Operator, but cannot be heard since the output has been set to 0. By increasing the Output Level of the AWM Operator, the piccolo sound is added to the glockenspiel voice.

Leaving the Voice Edit Function

You can exit the Voice Edit function from any of its display pages. To do this:

1. Press the VOICE EDIT button in the DISPLAY SELECT section once again.

The following display will appear, prompting confirmation of the operation.



2. Select "OK" to leave the Voice Edit function, or "Cancel" to abort the operation and return to the previous display.